

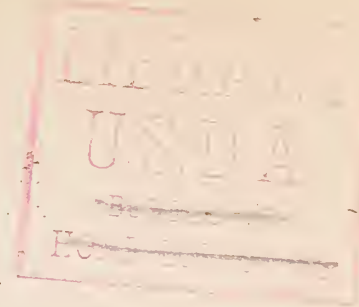
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U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF HOME ECONOMICS



JELLY MAKING

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To be able to make attractive and delicate jellies is an art of which any club member as a home-maker may well be proud. By following the directions given in answer to the questions asked, it should not be difficult for any club member to learn to make a good standard grade of jelly either for the family or for sale. Before beginning to make jelly, see that you have read the directions carefully, and have all the necessary equipment and supplies within easy reach. It is important that you know each step of the process. Jelly-making as an outgrowth of the canning club work is recognized in several parts of our country as an easy and interesting means whereby boys and girls may earn money. It is hoped that these directions may prove helpful to all such club members as well as to those who aim to make the family menu more attractive and palatable.

I. What is meant by homemade "natural fruit" jelly?

It is the juice of fruit (usually of a cooked fruit), boiled down with sugar or sirup so as to make a quivering, semi-solid mass. This mass should have the qualities described below.

II. How shall I judge whether I have succeeded in making an attractive fruit jelly?

1. An ideal jelly has a bright (or delicate) color due to the fruit from which it is made; and is not darkened because the uncooked fruit has stood too long after peeling, cutting, or mashing, or because of too long cooking.

2. The jelly should be transparent, or if its natural color is very deep, as in the case of blackberries, black raspberries, and other fruits, it should at least be translucent to some extent - not absolutely opaque. It should not be cloudy, and should not contain pulpy particles, bubbles, or visible crystals, either sugar crystals or those of any other kind, such as the tartrate crystals which occasionally form on or in a grape jelly.

3. There should be no scum nor bubbles at the top of the glass of jelly. It should be successfully sealed with paraffin or in some other good way, so that the top layer does not dry and toughen and become shrunken or concave from this cause.

4. It should not show any signs of fermentation or molding, either to the eye or to the sense of smell.

5. When turned out into a plate, it should hold its shape instead of breaking or flowing into a flattened mass. Liquid should not "ooze", or "weep", at the edges when the jelly is cut, unless it has been standing for some time. (Some fruit jellies, notably cranberry, nearly always "weep" within a few hours after cutting).

6. On the other hand, it should be tender and quiver when the plate is moved. It should cut easily with the spoon, yet break with a sharp cleavage line, and show sparkling faces. It should not be sticky, or tough, gummy, or brittle.

7. Its flavor should be as nearly like that of the fresh fruit as possible; it should not taste so acid as to be pronounced "sour", though it must be remembered that a jelly which is meant to be served as a part of the meat course may be more highly acid than one used for dessert.

8. It should not be sugary, sirupy nor over-sweet. Sugar should not be used in such quantities as to obscure the natural fruit flavor. It should not be necessary to ask "What kind of jelly is this?" because of the fact that a sweet taste, or sweet with mild acid, are the only flavors noticeable.

If sirup is used for sweetening instead of sugar, there should be no undesirable flavor due to the presence of the sirup; its flavor should blend with that of the fruit. The sirup should be so used as to impart sufficient sweetening to the jelly, and should not leave it flat in flavor nor yet disagreeably acid.

9. There should be no suggestion of caramelization nor of "burnt" flavor, unless for some reason a caramel flavor is considered distinctly desirable. There should be none of the sharpness which sometimes develops after too long cooking of a very acid juice with sugar, and which causes a "puckery" feeling on the tongue or in the throat.

10. The jelly should be stored in glasses of suitable size for the quantity which will be consumed within a day or two by the family for whose use it is intended. The cover over the top of the glass should be clean and attractive. The label on the glass should be suitable and attractive.

III. Why is it that some fruits easily make good jelly and others often fail to do so?

In order to make a fruit jelly which sets successfully, at least three substances must be present: Pectin, acid, and sugar. We always add sugar in the process of jelly-making, so it does not matter whether the fruit we are using contains sugar or not. But if the fruit contains little or no pectin it will not make a good jelly unless we add some pectin to it; and if it contains too little acid, even the presence of a large amount of pectin will not make jelly unless we add some acid to the fruit juice.



## IV. What is pectin?

Pectin is a substance which is found in most fruits and in many vegetables, but much more abundantly in some than in others. This substance can be cooked out of tart under-ripe apples, currants, orange peel, carrots, turnips, cranberries, etc. It can readily be seen as lumps of jelly, if a tablespoonful of alcohol is added to a tablespoonful of the fruit or vegetable juice which has cooked out. (Denatured alcohols can be used for this test, when grain alcohol is not available. Purchase the alcohol at a drug store.)

## V. How may I perform this test and see the pectin for myself?

The vegetable or fruit used must be cooked in a small amount of water only, or in water which is rapidly cooked down to a small amount. Use water just sufficient to cover, if it is desired to get a strong enough pectin to give a good test. The alcohol used may be grain, wood, or denatured alcohol. Use a glass dish to contain the mixture of fruit juice or vegetable juice and alcohol, so that the pectin may readily be seen. If there is a great deal of pectin present the whole mass of juice will presently set in a firm jelly; if very little, there will be only a few small lumps formed.

## VI. Is there more than one way of making this pectin set into a jelly?

Yes, there are a number of materials which may be added to a juice containing this pectin in order to make it set into a jelly; but they are not all edible or palatable. Of course we cannot use alcohol to make jellies for table use, and neither can we use such substances as Epsom salts, which will also cause it to gelatinize, or "set". Fortunately there are two common substances whose flavors combine with fruit juices in a way highly acceptable to most of us, and whose influence together is able to cause the pectin solutions of many cooked fruit juices to set, though neither one of them alone can make a jelly with pectin. One of these substances is sugar and the other is acid.

## VII. Does it make any difference what kind of sugar is used? Can we use sirups or "sugar substitutes"?

Either beet sugar or cane sugar may be used. Some other sweetening agents also may be used; e.g., glucose sirup and honey will each make successful jellies, so far as texture is concerned, although the flavor is of course very different from that obtained when ordinary granulated sugar is used.

## VIII. How shall we know how much sugar to use?

There is no particular amount of sugar which must always be used in making jelly; but as a rule, the more sugar you use, the more jelly you will get, up to a certain limit. For example, 1 cup of a good jellying fruit juice plus  $\frac{1}{2}$  cup of sugar will make about  $\frac{3}{4}$  cup of jelly; but 1 cup of this same juice plus 1 cup of sugar will make  $1\frac{1}{2}$  cups of jelly; However, it would be very foolish to use more than 1 cup of sugar to 1 cup of juice, in most

cases; not only would the jelly be too sweet, but it becomes sirupy and refuses to "jell" at all, when too much sugar is used in proportion to the pectin present. In fact,  $\frac{3}{4}$  cup of sugar to 1 cup of juice is a better proportion than 1 cup of sugar, in all cases except the most acid fruits.

IX. My mother makes good jelly, and yet she never adds any acid; why do you say, then, that sugar and pectin alone cannot make jelly without the help of acids?

Perhaps your mother has never tried to make jelly from a fruit containing little or no acid. In the fruits most used for jelly-making the acid is already present in the fruit juices and none needs to be added.

X. What are the fruits which are best for jelly-making?

The apple is an excellent jelly-making fruit. Certain kinds of crab apples are especially good for this purpose. Those apples which are best for jelly-making are always tart; on the other hand, a "mealy-ripe" apple will not make jelly, or only a little and with difficulty. Green or partly ripe grapes make better jelly so far as texture is concerned, than do ripe grapes, though even ripe grapes contain considerable acid. Partly green fruits usually make more jelly per pound of fruit, than do the ripe. Sour gooseberries, the more acid varieties of plums, sour quinces, (also Japanese quinces which often go to waste), red currants and hard firm berries, make delicious jelly. Quinces which are not sour, will make a nice jelly if you add a little tart apple juice, and so with sweet plums or ripe blackberries, etc. On the other hand, tomatoes, rhubarb, and lemon juice are all sour, yet they will not make jelly with sugar alone, because they do not contain pectin.

Thus we see why it is, that some fruits are so much more highly esteemed for jelly-making than others. Yet there are a number of other fruits besides those named above, which often make good jelly, such as elderberries, blueberries, choke cherries, etc.

XI. Why must the fruit be cooked before straining out the juice in order to make jelly?

Most of the pectin is in the pulp of most fruits, and so it is necessary to cook the fruit to get this pectin out into the juice, if you want to get a respectable yield of jelly, or indeed any jelly at all, in the majority of cases. Besides that, some of the water has to be driven out of the juice by boiling it down; or else the jelly would be too thin to set. However, there are occasional exceptions to this rule. The red currant, for instance, contains some pectin even in its raw juice, also much acid; the result is, that if the fruit is in just the right condition, you can crush the currants, add sugar to the juice which drains off, and get a little jelly even without cooking at all.

XII. What fruits are not good jelly-makers?

Strawberries (especially if soft and sweet), red raspberries, some blackberries (especially ripe sweet ones), peaches, sweet plums, quinces



which are not sour, pears, some kinds of cherries, and ripe non-acid mealy apples, are all apt to be more or less lacking in pectin or acid, or both, and therefore usually will not make good jelly by the ordinary methods. This is especially the case if the fruit is quite ripe, because both pectin and acid decrease as ripening progresses.

XIII. Is there any way of making good jelly out of these fruits?

The addition of 1 or 2 tablespoonfuls of lemon juice to a cup of the fruit juice usually improves the texture of these jellies, by increasing their tendency to set, and produces a larger amount of jelly from the same amount of fruit, than ordinarily would be possible. The addition of 1, 2, or 3 tablespoonfuls of a good pectin solution which has been cooked out of tart apples or out of orange peel, also improves both texture and yield.

XIV. Does it make any difference what kind of acid you use?

Not all acids are of equal value, in causing pectin jellies to set. The juice of lemons is especially good, probably because the citric acid it contains is one of the best acids to use. Rhubarb juice is very acid, but it is not so good a jelly-maker as is lemon juice, for it contains a different acid.

XV. Where can we get the pectin to use in making peach jelly, strawberry jelly, etc?

The pectin of tart apples is very commonly used to help out other fruits which lack it. Half apple juice and half red raspberry juice, or strawberry juice, or ripe grape juice, will often make an excellent raspberry, or strawberry, or grape jelly, in which the flavor of the apple is little noticed. Or, a small amount (1 to 3 tablespoonfuls to the cup of juice) of a concentrated apple pectin solution may be added to peach juice, strawberry juice, etc. to make a jelly.

#### Directions for making concentrated apple pectin solution.

The apples should be cut rather fine, covered with water (about  $1\frac{1}{2}$  pints of water to 1 pound of apple), and cooked in a pressure cooker 10 to 15 minutes at 10 pounds steam pressure; then take the fruit from the kettle, strain through double cheesecloth and test with alcohol for pectin. If this test is satisfactory, concentrate the juice by boiling rapidly in a shallow open kettle for an hour, or until you have only about one-fifth to one-eighth as much juice as you had at the beginning of this boiling period. Pour into scalded jars while still very hot (nearly boiling), cover with scalded lids, and seal at once; unless, of course, the pectin solution is to be used within three or four days.

This apple pectin is probably more satisfactory for berry jellies, from the standpoint of flavor, than is the orange-peel or lemon-peel pectin; for the latter has usually a slightly bitter flavor, even when we take the precaution of parboiling the peel for a few minutes and throwing this water away, before beginning the process of extraction by alternate soaking and boiling. However the lemon rind flavor combines well with lemon juice,

orange juice, grapefruit juice, and tomato juice (either green or ripe tomatoes), and jellies which many consider very good, may be made from these juices by adding the juice from peel which has been soaked and boiled in water.

XVI. How much and what apparatus shall I need for jelly-making?

Apparatus needed:

Basin and soap for washing hands.

Hand towels or paper towels, one for each worker.

One or more working tables suitably covered with oilcloth or with some smooth hard finish, or even with paper.

Pans to hold the fruit.

Water for washing fruit.

Brush for hard fruit.

Colander in which to drain soft fruit.

Reliable scales.

Paring knives.

Covered waste jar or pail.

Quart or pint and half-pint measures.

Granite or enamelware sauce pan (not metal.) A double boiler may be used for cooking fruit, if preferred.

Long-handled spoon of the same material or of hard smooth wood.

Stove or "hot plates" of some kind for cooking fruit and juice, heating water and paraffin. Space for two kettles or pans is necessary.

Jelly bags of cotton flannel or of double cheesecloth or muslin.

Wire rack or wooden support from which to hang jelly bag while dripping.

Sugar receptacle and spoon.

Jelly glasses and cover.

Kettle of water to be heated for scalding or boiling the jelly glasses, large enough to hold a number of glasses at once.

Paraffin for sealing.

Small tin sauce pan or cup or coffee pot or other receptacle for melting and pouring the paraffin.

Dish pan, dish mop, soap, and dish towels.

Bottle of alcohol for testing pectin.

XVII. How must I proceed in order to make jelly out of my fruit?

The process of jelly-making consists of four parts:

First, preparation of the fruits.

Second, extraction of juice from the fruit by cooking (to supply the jelly with flavor, pectin, and acid).

Third, concentration or "boiling down" of this juice, if it proves to have too much water in proportion to its pectin.

Fourth, boiling together of juice and sugar, until the jelling point is reached.

XVIII. How should the fruit be prepared?

Selection of Fruit for Jelly-Making.

3 (7-13-23) As we have just seen, over-ripe fruit must be discarded, unless we



are to add pectin solution to it; also the use of especially sweet, non-acid fruit, must be avoided, unless acid is to be added during the process of jelly-making.

#### Cleaning the Fruit.

Prepare firm fruit by washing it clean, trim off any unsound portions, cut it into small pieces, place in the kettle or saucepan in which it is to be cooked, and add only enough water to cover it. Prepare soft fruit by sorting and washing, taking care not to bruise or crush the fruit; drain in colander; no water need be added for cooking. Mash the bottom layer, to start flow of juice and prevent burning.

#### Trimming the Fruit.

Do not peel the fruit, as this is unnecessary waste of both labor and material in most cases. On the other hand, when apple-peelings and cores, or grape skins can be had in any considerable quantity, they may be used, alone or with other fruit, to make a very fair grade of jelly. Furthermore, it is often the case that the color of the jelly comes from the color of the skin of the fruit, as in apples, plums, and grapes.

Do not remove cores, unless the seeds are found to give the jelly a bitter or astringent flavor. This is recommended to save time and material; furthermore, it is believed that in some instances the core is even richer in pectin than is the remaining part of the fruit.

Since the skins are to remain on the fruit especial pains must be taken in washing and trimming. Dirty peelings and decayed or bruised spots will lend their flavor to the juice extracted from them and injure the jelly made from that juice.

#### Weighing the Fruit.

It is interesting to know how much jelly you should be able to make from a pound of each kind of fruit. Also it is interesting to know how much the jelly has cost and how much it would sell for. You will thus need to weigh the fruit before washing, trimming, and removing stems or leafy bits, etc., since its money value is determined by its weight before these things are done. This is called its weight "as purchased." But it is also wise to take the weight after all refuse has been removed; since a fair test of your skill in jelly-making should measure the amount of jelly made from the good fruit you had to work with, and not the amount of good fruit plus refuse.

Do not allow uncooked fruit to stand longer than is necessary, especially not between washing and cooking. Flavor is impaired by such standing, especially after water is added. The color of white-fleshed fruits, such as peaches, pears, and apples, darkens very rapidly after being cut, especially when exposed to the air.

XIX. What kind of kettle is best for jelly-making?

Fruits, especially concentrated fruit juices, should be cooked in very clean vessels of enamel ware or some bright, well-polished metal. Do

not use iron, copper or brass. Fruit acids act more or less on some metals and the result is sometimes that an unpleasant flavor or even injurious substances are produced in the juice.

The diameter of the kettle in which the juice is cooked should be large enough to give the juice a broad surface in proportion to its depth, so as to hasten the cooking process and thus prevent injury to the pectin, by long boiling and slow concentration.

XX. How shall I know how much water to use?

No water need be added to soft juicy fruits, for too much water dilutes the pectin and prevents it from setting into a jelly. Berries which are somewhat mealy, however, or have heavy skins, - as is the case with cranberries, - need to have some water added, usually about half as much water as cranberries. Hard fruits cut into pieces may be cooked in "water to cover", but if boiled too rapidly, there will not be enough juice left at the end of the cooking process.

XXI. How can I tell when the fruit has been cooked long enough?

Cook the fruit at a moderately rapid rate until the tissues are soft, but take care not to cook too slowly and long, nor to overcook. No special time limit can be set; with a hot fire the time will be shorter, with a slow or moderate heat the time will be longer. However, the cooking should usually be completed within half an hour, or frequently in much less time. Separation of seeds from pulp is often a useful indication as to the stage at which cooking may be discontinued. Watch carefully during the cooking process to see that liquid does not boil away too rapidly. If necessary to add more water before completing the cooking, this should be done during the first half of the boiling process rather than during the last half, in order to avoid the production of an insipid dilute juice.

XXII. How long shall I let the juice drip?

At the end of the cooking period there should be enough liquid left so that the pulp is fairly well drained within ten to twenty minutes after it has been poured into the cloth jelly-bag, without the necessity for squeezing the bag. It is not necessary to let the jelly-bag drain all night.

XXIII. Shall I squeeze the jelly-bag?

Ordinarily, do not squeeze the jelly-bag, as the juice which comes through after squeezing is sure to be cloudy. However, if there is no opportunity to cook the pulp a second time either for fruit butter or for the making of a second lot of jelly, the bag may be squeezed, and the cloudy juice may be made up separately from the clear juice, into jelly of a second grade quality.

XXIV. Shall I throw away the pulp left in the bag?

The pulp in the bag after this first draining process, may very likely have a good deal of pectin and flavor left in it; in that case it



should be "extracted" again, i. e., cooked again after the addition of fresh water. In order to determine whether to make a further extraction, test the juice which has just dripped through for pectin, as described on page 3. If it contains a large amount of pectin which sets firmly and rapidly on addition of alcohol, there is probably a considerable amount of pectin left in the pulp, and it will pay to try for more jelly. In that case, weigh the pulp, add about half as much water by weight as you have pulp, and cook a second time, boiling rather rapidly for five to ten minutes. Watch closely to see that there is sufficient water left at the end of the process to drain freely.

In some cases, a third extraction may well be made by adding water to the pulp left after the second dripping, and cooking the pulp a third time.

If the pulp has been cooked or extracted only once, it will probably pay to make it up into a fruit butter or paste by putting it through a sieve and cooking it with sugar, a little salt and spice, if desired. However, the pulp which has been extracted three times has little flavor left, and will not make a good fruit butter unless it can be combined with a sirup of good flavor, such as that left from canning fruit or from sweet pickles.

XXV. If I cook and strain the same pulp two or three times, what shall I do with all of these different drippings?

It is a good idea to put all the extractions together, since the flavor of the first extraction is usually the best and that of the last extraction may be decidedly flat, even though it contains enough pectin to set into a firm jelly. Also the last extraction is likely to be lacking in acid, and that means that the sugar in it is more likely to crystallize after the jelly cools and stands. If mixed with the first extraction it is less likely to give trouble in this way.

Measure carefully the number of cupfuls of juice you have obtained. How many pints of juice to the pound of fruit?

XXVI. How shall I know when to add the sugar to the fruit juice and how much to add?

This is the stage in jelly-making at which good judgment is most necessary. If you add too much sugar or add the sugar too soon, you may boil and boil without ever getting a jelly and have only a thick sirup in the end. On the other hand, if you add too little sugar or boil the juice too long before adding it, you will have a gummy, tough jelly.

You must learn to judge from the pectin test with alcohol. If the pectin sets almost instantly into a firm jelly when alcohol is added to a sample, you need not boil the juice down at all before adding the sugar; and you may add either  $\frac{3}{4}$  of a cup of sugar or 1 cup of sugar, to 1 cup of juice. If it takes some minutes for the pectin jelly to set, and if it seems wet and weak after setting, or has liquid oozed out around the edges, it will be safer to boil the liquid down to at least three-fourths of its original amount before adding the sugar. If there are only a few scattered pectin

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lumps floating about in liquid, in the test glass, then the juice should be boiled down to at least one-half of its original amount, if it is to be used at all.

This boiling down or concentration should be done rapidly, as long boiling injures the pectin and makes it less likely to set in the end.

XXVII. Is it necessary to heat the sugar in the oven before adding it to the juice?

No. The only reason for heating it is to shorten the time of jelly boiling. If the juice is boiling hot when you put the sugar in, the boiling process will be checked only for a minute or two, by the addition of the cold sugar. Boil rapidly after that, until time to take the jelly off. Watch carefully and test constantly during the boiling, which should take only five to ten minutes, perhaps even less.

XXVIII. When shall I skim the jelly?

Skim off the scum which rises to the top, at the end of the cooking process, just before pouring into the glasses. This causes less waste from skimming than when the jelly is skimmed constantly during the cooking process.

XXIX. How shall I know when the jelly is done?

Dip the spoon into the boiling juice, then raise it above the liquid, and let the juice run off from the side of the spoon. When the jelly is done, the juice will be so heavy that the last portions will sheet off, or break off in sheets, instead of trickling in drops as at first. Some authorities speak of this test as the "two-drop" test, because the juice drips in two lines of drops from the edge of the sheet, instead of in a single line of drops from the spoon. Take the jelly from the fire instantly, when this point is reached as further cooking will spoil it.

If the candy thermometer is used as a test, the jelly will as a rule be done when the thermometer reads 219° to 221°F. (104° to 105°C.), if the amount of sugar used is equal to the amount of juice used; or lower, if a smaller proportion of sugar be used.

XXX. How should I prepare the jelly glasses for use?

Put glasses and covers into a pan of cold water so that the water completely covers them and let this water slowly come to a boil. Remove from the fire, let stand in the hot water until the jelly is nearly done. Then fish them out of the hot water with a spoon or fork, handling them as little as possible; drain, and let them dry themselves. Pour the hot jelly into the hot glasses. Keep the covers in a clean place until the jelly has set.

Neglecting to boil the glasses may cause fermentation of the jelly after a few weeks, in some cases. Scalding the glasses with hot water is not so good a precaution against this undesirable result as boiling them.

XXXI. How soon should the jelly be set?

A rich juice will often set and be perfectly firm within an hour or

two after it is poured. However, a sweet juice somewhat lacking in acid, is slow in setting. If left uncovered or lightly covered with paper or cloth, in a dry place, a blackberry jelly or a non-acid apple jelly will sometimes take a week or two to become perfectly firm. Such a jelly sets faster if poured into shallow glasses rather than into tall narrow glasses.

XXXII. What can I do, if the jelly fails to set at all?

If the jelly is fairly acid and gives a good pectin test, it may be re-boiled for five to seven minutes, when it should surely set. If, however, it seems to become more sirupy instead of more jelly-like as it boils, and persists in threading from the spoon instead of sheeting off, then it needs to have acid or pectin added, or both.

XXXIII. If I use pectin or lemon juice in my jelly, how and when should I add it?

Bring the juice to a boil, then add the pectin (1 to 4 tablespoonfuls to the cup of juice, according to the strength of the pectin test). Add lemon juice (1/2 to 1 tablespoons to the cup of juice) and sugar at the same time.

XXXIV. What is the best way to cover jelly?

The use of paraffin is a simple method. Cut or shave the paraffin into a cup or small saucepan or small tin coffee pot, melt over low heat, let heat for a few moments without smoking, pour over cool jelly in sufficient thickness so that the layer will not break when cold. After the paraffin layer has cooled, place tin tops on glasses or paste paper over them, label neatly, and store in a dry, cool, dark place.

XXXV. How should jelly be scored?

Score Card For Jelly.

Kind of Jelly _____		Number of Sample _____	
Points	Perfect Score	Actual Score	

1. Package.

Glasses of good shape, suitable size; tops clean, free from tarnish, tight; paraffin layer (if any) thin, smooth, no bubbles nor breaks, labels suitable, attractive. 5

2. Color.

10

Color natural, as determined by the fruit used, no artificial coloring.  
Color deepened by wise use of sugar or other sweetener, not darkened by overcooking.



3. Clearness. 10

Transparent or translucent, not cloudy nor containing pulpy particles. No bubbles nor visible crystals.  
No mold nor signs of fermentation.  
No scum nor bubbles at top.

4. Texture (judged after glass is opened): 40

Should hold its shape when turned out on to a plate; yet should quiver when plate is moved. Should cut easily with spoon, be tender, yet break with sharp cleavage line, and show sparkling faces. Not sticky, tough, gummy, nor brittle; not sirupy; not sugary; no crystals that can be perceived on tongue.

5. Flavor. 35

Attractive, pronounced fruity flavor, yet not sour; nor yet over sweet; nor caramelized, nor scorched.

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Total 100

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Remarks:

XXXVI. How much juice should I expect to get from a pound of trimmed fruit, and how much jelly should it make?

That depends a good deal, of course, upon the kind of fruit used, upon the amount of sugar used, and upon the flavor required by your standard for that particular kind of jelly. It is sometimes possible to get nearly three pints of jelly from a single pound of cranberries by using a large amount of water and making several extractions; such jelly may have a beautiful texture and color (long cooking brings color out of the skins in the last extraction), but it will not be rich in flavor.

From 1 to 3 cups of juice per pound of trimmed fruit includes the average yield of most fruits. If 1 cup of sugar be used to 1 cup of juice, there will be from 1 to 3 cups of jelly. Crabapples, apples, currants, and cranberries, if in prime condition, should yield from 2 to 3 cups of jelly per pound of trimmed fruit. Ripe grapes and berries can hardly be expected to yield more than 1 cup of jelly per pound of stemmed fruit, unless pectin or acid (or both) be added. These additions do of course modify the flavor somewhat, particularly if the pectin solution be not quite of choice quality.

XXXVII. How may I prevent the formation of rough crystals in ripe grape jellies which stand for several months?

It is difficult to prevent these tartrate crystals from forming



in an all-grape jelly of ripe fruit where the juice has to be concentrated a good deal in order to make a jelly. Mixing the ripe grape juice with half green-grape juice or with one-quarter to one-half as much tart apple juice will prevent it. If the juice is all ripe grape, however, and you fear trouble of this kind, one thing that can be done is to can the grape juice in quart jars; open a jar occasionally and make a few glasses of jelly at a time, using them up before they have a chance to crystalize.

Another method consists in allowing the juice to stand for two or three days in a cool place, after it has dripped from the jelly bag and before the sugar is added. The crystals then form and settle to the bottom, and may be strained out; or the juice may be decanted or siphoned from off the crystals.

NOTE - Studies which have been made in this office since the completion of the above mentioned mimeographed statement, indicate the development of satisfactory methods of making apple pectin without the use of steam under pressure.

